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1 **WHAT IS CLAIMED IS:**

2 1. A method for verifying the design of a disk controller circuit to be incorporated
3 into a targeted hard disk drive system, wherein the targeted hard disk drive system comprises a
4 read/write channel and a head actuator, the method comprising the steps of:

5 emulating reading and writing of data in the read/write channel based upon a model of the
6 read/write channel;

7 emulating a behavior of the head actuator during track seek and track following
8 operations based upon an electromechanical model of the head actuator;

9 providing a disk controller design base for defining integrated circuit elements
10 comprising the disk controller circuit;

11 providing a controller environment to support execution and debug of firmware for
12 operating the disk controller circuit;

13 performing a plurality of disk functions according to a script, wherein the plurality of disk
14 functions comprise interaction of the read/write channel model, the electromechanical model, the
15 disk controller design base and the controller environment.

1 2. The method of claim 1, wherein the plurality of disk functions are performed at a
2 time-scaled rate, wherein the time-scaled rate maintains an accurate relative time relationship
3 between the plurality of disk functions performed under direction of the script, and a real-time
4 performance of the disk functions.

1 3. The method of claim 1, wherein the plurality of disk functions are performed at a

- 2 plurality of environmental limits, wherein the models and the design base are made to operate
3 according to their predicted behavior at the environmental limits.

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